REMARKS

The December 21, 2010 Office Action noted that claims 8-10 were pending; objected to claims 9 and 10 as reciting allowable subject matter, but dependent from a rejected base claim; and rejected claim 8 under 35 U.S.C. § 103(a) as unpatentable over articles by Fischer et al., "Space-Time Transmission using Tomlinson-Harashima Precoding" and Ginis et al., "Multi-user Precoding Scheme achieving Crosstalk Cancellation with Application to DSL Systems." Claims 8-10 remain pending and under consideration. The rejection is traversed below.

In the rejection of claim 8 in paragraph 8 on page 4 of the December 21, 2010 Office Action, it was acknowledged that the article "Space-time Transmission Using Tomlinson-Harashima-Precoding" by Fischer et al. does not disclose "applying the nonlinear precoding method only to a reduced channel matrix ... whose interference elements are chosen to assume the range of values ... from the set of positive or negative integers including zero" (claim 8, last 4 lines). To overcome this deficiency, the December 21, 2010 Office Action cited page 1628, column 1 of Ginis et al. as teaching "only to a reduced channel matrix Hred that is calculated from the equation H = Hred R, whereby H is the known channel matrix and R is a residual interference matrix R, whose interference elements are chosen" (Office Action, page 4, paragraph 9, apparently quoting words on lines 11-13 of claim 8 without using subscripts).

Furthermore, in the Advisory Action mailed March 9, 2011, it was asserted that claim 8 as previously recited "does not explicitly state or suggest that the 'residual' matrix refers exclusively to the partial precoding at the transmitter side that leaves residual (remaining) interference signals at the receiver side" and as a result, the triangular matrix described in Ginis et al. allegedly disclosed the limitation previously recited at the end of claim 8. In an effort to avoid this interpretation of the limitations in claim 8, claim 8 is amended herein to clarify what is represented by the residual interference matrix R.

As now recited at the end of claim 8, "R is a residual interference matrix indicating remaining interferences at the receive-side, the residual interference matrix containing interference elements chosen to assume a range of values $A_k \cdot M_k z_{kl}$, where z_{lk} is from the set of positive or negative integers including zero." Thus, there is not complete crosstalk cancelation but rather a partial precoding at the transmitter side that leaves residual (remaining) interference signals at the receiver side. Moreover, this provides the benefit that the partial precoding (with full precoding only for H_{red}) can be arranged (via particularly permitted residual interferences, described by the interference matrix R) such that the residual interference at the receive-side

does not adversely affect independent decision making in the (independent) receivers, as described, for example, in paragraphs [0015] to [0017] of the Substitute Specification.

On the other hand, as noted in its abstract, Ginis et al. describes a method that "borrows from the concept of the Tomlinson-Harashima precoder ... for ... application ... in Digital-Subscriber-Line (DSL) systems" and according to the title, this "achiev[es] Crosstalk Cancellation." Specifically, as stated in the last three lines of text in column 1 on page 1628 of Ginis et al., "the concept of modulo arithmetic" employed by a Tomlinson-Harashima precoder, is extended "to the 'space' dimension." As described in the last two paragraphs in column 2 on page 1627 of Ginis et al., "appropriate signal processing at the transmitter can achieve interference-free reception" by applying these concepts in a Multiple-Input-Multiple-Output (MIMO) channel. According to the top of column 1 on page 1628 of Ginis et al., this is accomplished using "an L x L upper triangular matrix" R.

It is submitted that the triangular matrix R described in column 1 on page 1628 of Ginis et al. is not equivalent to "a residual interference matrix indicating remaining interferences at the receive-side, the residual interference matrix containing interference elements chosen to assume a range of values $A_k \cdot M_k z_{kl}$, where z_{lk} is from the set of positive or negative integers including zero" (claim 8, last 4 lines) for "user signals consisting of data symbols a_k with k from 1 to K from a signal constellation having M_k levels and a signal point spacing A_k" (claim 8, lines 4-6). Nothing has been cited or found in Ginis et al. suggesting that the triangular matrix R described in column 1 on page 1628 of Ginis et al. is "a residual interference matrix indicating remaining interferences at the receive-side" as recited in claim 8. In particular, given that the method taught by Ginis et al. has the capability of "achieving Crosstalk Cancellation," it is clear that the triangular matrix R described in column 1 on page 1628 of Ginis et al. is not equivalent to the "residual interference matrix R indicating remaining interferences at the receive-side," as there would be no interference at the receive-side in a system capable of "achieving Crosstalk Cancellation."

For the above reasons, it is submitted that claim 8 patentably distinguishes over "Space-time Transmission Using Tomlinson-Harashima-Precoding" by Fischer et al. in view of "Multi-user Precoding Scheme achieving Crosstalk Cancellation with Application to DSL Systems" by Ginis et al. As claims 9 and 10 depend from claim 8, it is submitted that claims 8-10 are in a condition suitable for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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